

## **Chapter I**

# **THE ST. LAWRENCE AND THE CORPS OF ENGINEERS**

### **Early Navigation on the St. Lawrence**

Europeans first travelled the St. Lawrence in the 16th century. Cartographers then believed that a waterway existed that would provide a navigable westward route to China and India. The English and the French showed the greatest interest in the route to the East, barred as they were by Spanish and Portuguese naval power from southern routes. In 1535 Jacques Cartier sailed into the St. Lawrence on a voyage commissioned by Francis I of France. He was looking for gold, as well as the northwest passage to China and India. During this trip he sailed a thousand miles only to be stopped by the La Chine, now Lachine, Rapids. Although Cartier never returned, he opened the river and its tributaries to trade in fish and furs. At the beginning of the next century Samuel de Champlain moved farther inland. He travelled to Georgian Bay, connected to Lake Huron, and eventually to Lake Ontario. These explorations gave him an inkling of the connection between the St. Lawrence River and the Great Lakes. Later in the 17th century, Robert Cavalier de LaSalle opened up the other Great Lakes to the French fur trade. LaSalle's later explorations to the mouth of the Mississippi helped provide the French with the wherewithal to maintain an empire in the new world. The St. Lawrence thus played a part in French attempts to expand and then maintain its empire in the new world. French military and commercial outposts along the St. Lawrence and the Great Lakes gave them control of the fur trade.<sup>1</sup>

By the last third of the 18th century, the substantial trade in furs, fish, and military supplies led to calls for the building of canals to bypass some of the dangerous rapids in the St. Lawrence River. Interest in such canals goes back to 1680, although early efforts generally failed for lack of funds. Success finally occurred after 1778. In that year the governor of Quebec, Frederick Haldimand, proposed a series of locks and canals between Montreal and Lake St. Francis. Work began in 1779, and within a year a canal system opened with three locks. It was the first lock canal in North America, with a total length of 900 feet. The three locks were 40 feet long, 7 feet wide and 2.5 feet deep, allowing passage only to the shallow boats commonly used in the fur trade at the time.<sup>2</sup>

In the 19th century these modest successes encouraged grander plans. Both Canada and the United States expanded economically. By 1800 settlers had moved into the upper St. Lawrence Valley and southern Ontario, as well into the Ohio Valley. Supplies to and, later, exports from this region were difficult to move because of the rapids in the river. The river's potential became clearer with the introduction of steam-powered craft. In 1809 the first

steamship went into service on the lower St. Lawrence, cutting to three days the 15-day sailing time from Montreal to Quebec. In 1818 steamboat service appeared on the Great Lakes between Kingston and Prescott. Steam power improved to a point that by 1833 some of these craft negotiated the least violent of the rapids. As a rule, however, transshipment was still necessary.<sup>3</sup>

Increasing settlement and higher levels of trade made the river's hindrances more and more troubling to farmers and merchants. The economic growth of southern Ontario and the Middle West enhanced the importance of the St. Lawrence as the shortest route between the North American interior and Europe. Growing trade in agricultural and forestry products sharpened the need for improved transportation. This need, however, was satisfied by the Erie Canal, which served both as a hindrance and a model to advocates of improving the St. Lawrence.

Begun in 1817 the canal proved an enormous success even before its entire 363 miles were completed. Its \$7 million cost seemed entirely justified because of the prosperity it brought to the towns and cities along its route and because of the significant reduction in transportation costs. The canal connected Albany and Buffalo, following the Mohawk River valley from the Hudson River, and cutting overland to Lake Erie. The canal became the primary source for shipping grain east. Connected ultimately to the port of New York, the canal provided access to a port that in contrast to Montreal and Quebec was open almost all of the year.<sup>4</sup>

The success of the Erie Canal created a canal boom in the United States. Merchants in Montreal were equally impressed with its achievements and benefits and used its success to press for further canal work along the St. Lawrence. They thought that Montreal could benefit just as New York City had. Steps already had been taken by the time the Erie Canal opened. The War of 1812 demonstrated the importance of communication for military defense. Lower Canada approved a canal at the Lachine Rapids. Initially, nothing came of this effort, but three years later, in 1818, a joint committee of representatives from Upper and Lower Canada recommended building canals on the St. Lawrence west of Montreal. In any event, Lower Canada began work on a canal between Lachine and Montreal in 1821 and the first Lachine Canal, with its seven locks, opened in 1825.

Other canal projects were also affected. As early as 1798 traders had suggested a canal to bypass Niagara Falls. Work on that project, however, was not begun until 1824, and, although private investors were responsible for beginning the first project to circumvent the falls, the Welland Canal was finally completed only in 1829 after the Imperial government made land grants to the canal company and the government of Upper Canada made loans.<sup>5</sup>

The 1830s brought the construction of other canals along the St. Lawrence route as well as the founding of the first of the St. Lawrence lobbies, the Association for the Improvement of the St. Lawrence. It was only one of the many groups that would espouse the advantage of a ship canal along the St. Lawrence. In 1841, the year after the union of Upper and Lower Canada created one province in the Great Lakes-St. Lawrence region, the lobbyists

succeeded in getting a commitment for the building of a series of canals and the deepening of existing facilities to nine feet. By 1855, when the State of Michigan opened a canal around St. Marys Falls, ships drawing eight feet of water could sail all the way into Lake Superior.<sup>6</sup>

These canals, however, enjoyed limited success. For one thing, they had cost \$20 million in public and private funding—a large sum for a country with a population, in 1850, of only two million. For another, railroad construction competed for available capital, and when the lines were completed, for traffic. Canada underwrote the Grand Trunk Railway, constructed between 1852 and 1863. It went from Chicago through Toronto and Montreal to Portland, Maine, and competed directly with the St. Lawrence canals for business. The canals ended up with the bulk grain and coal cargoes, while the railroads took the more profitable commodities, especially manufactured products. By the last third of the century, the railroads had even begun to make inroads into the canals' handling of bulk cargoes.<sup>7</sup>

In 1867 the passage of the British North America Act, based on the carefully wrought Quebec Resolutions, brought about the confederation of the united province of Canada and the provinces of Nova Scotia and New Brunswick. The new federal government wished to protect western agricultural as well as eastern mercantile and shipping interests, and, at the same time, gain general popular support by countering American route and carrier competition. The Dominion's leaders, however, soon faced problems similar to those facing the American government, and their efforts were slowed by economic and political pressures, particularly the need for a comprehensive transportation policy.

As indicated above, the St. Lawrence canals had begun to feel the effects of railroad competition even before confederation. In the 1850s the railroads had complemented canal service; by the next decade they had clearly captured a portion of the east-west trade. Rail transport was faster than shipment via the canals, and trains could operate in the winter. The growing size of ships on the upper lakes also hurt St. Lawrence traffic, especially as there had been no enlargement of the Welland Canal which connected Lake Erie to Lake Ontario and the St. Lawrence. Canadian and American Great Lakes merchants saw improvements in the St. Lawrence as obvious. But political leaders had other considerations. One counterproposal was a canal between Montreal and Georgian Bay. This route, its advocates maintained, would be important to Canadian defense, allowing the government to better protect the Lakes. But this and other alternative proposals to improve the movement of goods from west to east were very costly; the cheapest solution was to improve the Welland and St. Lawrence canals and to build a canal at Sault Ste. Marie. Parliament accepted that solution in 1872, based as it was on an 1871 report by a royal commission appointed at the behest of the Minister of Public Works.<sup>8</sup>

The federal government, however, did not place a very high priority on these works. They were delayed at times for lack of revenue, but more often because the government faced more pressing issues: the financing of a trans-continental railway, formulation of a western lands policy, and negotiation of

a reciprocal tariff treaty with the United States. Nevertheless, by the 1880s, increasing trade had again brought attention to the deficiencies of the Welland Canal. Dissatisfaction with what farmers and merchants saw as discriminatory practices by railroads also increased the political pressure to improve the St. Lawrence canals. Piecemeal, the government began asking for increased appropriations to upgrade the canal system. Gradually, through the late 1880s and 1890s, the work progressed despite delays due to politics and economics. It was interrupted by a nasty political battle over whether the Beauharnois Canal on the south side of the St. Lawrence should be enlarged or a new canal should be built on the northern side. Technical considerations gave added weight to the argument for the latter, and the Soulanges was approved in 1891. Depression in the 1890s caused further delays, but work resumed in 1896. The Soulanges was completed in 1899, the Cornwall in 1900, the Lachine in 1901, and the Williamsburg in 1904.<sup>9</sup>

The government thus completed its program to deepen the St. Lawrence canals to 14 feet. But, by that time, the new canal system was becoming outdated. Ship technology had advanced to such a point that a 14-foot depth no longer accommodated the majority of ocean-going ships. And, as always, by comparison shipment through the canal system was slow. There were only 41 miles of canals, but the system needed 22 locks to lift vessels the required elevation of 209 feet. At the same time, increased traffic on the Great Lakes heightened awareness of the inadequacies of the St. Lawrence canals. And, after 1914, the Panama Canal provided additional, and significant, competition; prairie grain could be economically shipped from Vancouver to Europe. The St. Lawrence canals satisfied neither the growing needs of Great Lakes commerce, nor the increasing demands of western Canada—Midwest merchants turned to the railroads, and the profitable business of western Canada looked south to the Panama Canal. Those needs affected both Canadian and American businessmen in the Great Lakes area and ultimately raised the kind of public interest that led to plans for comprehensive projects on the St. Lawrence.<sup>10</sup>

## **The United States and the St. Lawrence**

American interest in the St. Lawrence did not approach Canadian concern until late in the 19th century. The St. Lawrence River, after all, was almost entirely in Canadian territory. Even so, the river and its potential increasingly figured in the thoughts of American farmers, merchants, and industrialists. Increased attention led to the studies and commissions that eventually brought about closer collaboration between Canada and the United States in developing the St. Lawrence.

Americans first became interested in the river as part of efforts to improve transport on the Great Lakes. As long as the population in the region remained sparse, neither Congress nor most Presidents were willing to seriously consider coordinated improvements in connecting the Great Lakes. The most pressing problems were the shallow channels of the St. Clair Flats which connected Lakes Erie and Huron and the St. Marys Falls which hindered traf-

fic between Lakes Huron and Superior. As the population increased, the federal government came under growing pressure to take part in improving Lakes navigation.<sup>11</sup>

The Army Corps of Topographical Engineers, a separate engineering corps from 1838 to 1863 when it was reunited with the Corps of Engineers, became involved in the efforts to improve Great Lakes navigation in 1841. That year the Chief of Topographical Engineers, Colonel John J. Abert, began to recommend that harbors and channels in the Great Lakes region be improved. Included in his annual reports, the recommendations were accompanied by detailed analyses of conditions that would make improvements feasible.<sup>12</sup>

To act on the proposals would have cost considerable sums of money. And, in any event, many of the Presidents in the two decades before the Civil War seriously questioned the authority of the federal government to carry out "internal improvements." For most of those years, the Democrats were in power and, as a rule, they opposed the idea of federal support of internal improvements. Whig politicians generally took a "looser" constitutional view of the issue, supporting federal assistance to internal improvements. The Whigs, however, held the presidency for only eight years during that period, and for over three of those eight years John Tyler held office. Succeeding the brief administration of William Henry Harrison, Tyler was in fact a Democrat who opposed the broadly-conceived constitutional views of Whigs on the role of the federal government in helping bring about economic development. Democrats dominated the debate, arguing as James Polk said that "to regulate commerce does not mean to make a road, or dig a canal, or clear out a river, or deepen a harbor."<sup>13</sup>

Such views led to organized political lobbying in behalf of improved navigation in the Great Lakes region. Lakes port interests in particular argued that only the federal government could coordinate among the states and provide the resources necessary to improve navigation in the area. On constitutional grounds, these groups justified action as protecting common interests, in which they included the development of interstate and foreign trade.<sup>14</sup>

The federal government's policy changed in 1850 with the inauguration of Whig Millard Fillmore, who came to office at the death of Zachary Taylor. Of the projects Fillmore approved, the most important was perhaps the granting of 750,000 acres of federal land to the State of Michigan to assist in financing construction of a canal around St. Marys Falls. Other legislation provided for improvements in the St. Clair Flats. In approving federal appropriations for improvements in the Great Lakes region, Fillmore was responding to economic change. There had been significant growth in Great Lakes commerce in the 1830s and 1840s. Traffic on the Lakes, negligible in 1820, reached nearly 55,000 tons in 1841, then almost tripled in the next decade. In 1845 commerce on the Lakes was valued at \$100 million, increasing to \$251 million in 1855. This growth was in good measure a result of the development of copper and iron ore mines in Michigan and Minnesota. To maintain that growth, however, Great Lakes shippers, in effect, supported two separate merchant marines, one on the upper and the other on the lower lakes. Defense

arguments also played a part in gaining improvements in the Great Lakes. Advocates of federal assistance made the case that opening links among the lakes would enhance naval defense.<sup>15</sup>

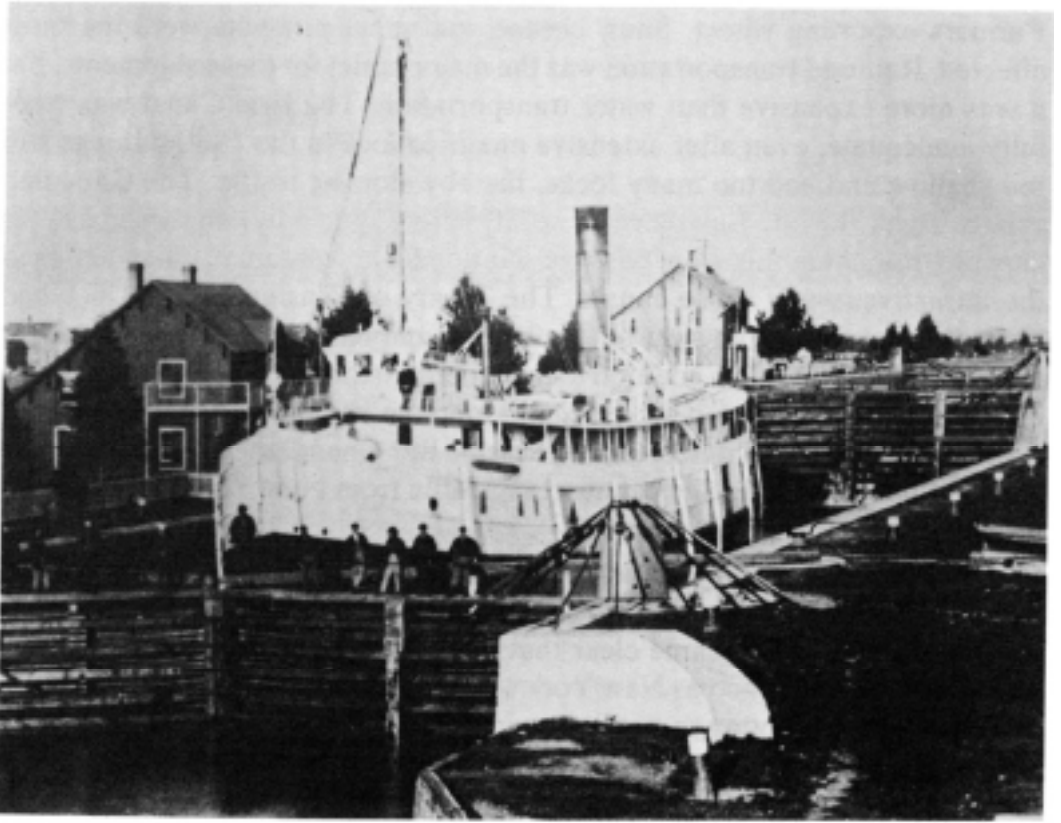
Fillmore's initiatives, however, were short-lived. His successor, Franklin Pierce, opposed internal improvements as had many of his Democratic predecessors. Yet his stubborn opposition prompted Great Lakes businessmen to organize a campaign for internal improvements. They gained the support of their state and federal legislators, and, in 1856, over the President's veto, Congress appropriated funds for dredging the connecting channels. This work was completed by the Civil War, but further projects were successfully vetoed by Democrat James Buchanan.<sup>16</sup>

The Civil War restimulated support for navigational improvements in the Great Lakes area. Fear of war with Great Britain lent credence to proposals to further improve the connecting channels. Military considerations prompted examinations of ways to improve American routes between the Midwest and the Atlantic. The Canadian canals on the St. Lawrence were, however, the focus of concern, since the British could use them to gain entrance to the Lakes. These arguments were not convincing. For one thing, the Rush-Bagot Agreement prohibited both the United States and Great Britain from placing war ships on the Lakes. Even so, the St. Lawrence canals would not accommodate most of Britain's warships. The debate, however, did underscore again the increasing economic importance of the Great Lakes. At the same time, it drew attention to the inadequacies of the Erie Canal which even though deepened to seven feet needed further work to meet the needs of new ships and increased commercial traffic from the Lakes ports.<sup>17</sup>

Wartime pressures on the Treasury, as well as traditional sectional jealousies, prevented approval of any grandiose plans to improve America's European trade. Congress, however, did realize the advantages of the St. Lawrence route. Despite the facts that it was almost entirely in Canada and that American shippers had to pay Canadian tolls through the Welland and St. Lawrence canals, the system was superior—and cheaper—to anything proposed by the American government. Bitterness toward Great Britain and Canada quickly ended after the Civil War, and American farmers and Great Lakes merchants again looked to the St. Lawrence route.<sup>18</sup>

## **The Corps and the St. Lawrence**

Although initially opposed to United States participation in improvements in the St. Lawrence, a waterway substantially in Canadian territory, the Corps of Engineers did support improvements in the Great Lakes system. In 1870 the Chief of Engineers, Brigadier General Andrew A. Humphreys, supported local pleas for improvements in the St. Marys canal. Rapidly expanding trade and larger vessels had taxed the canal to its limit. At the least the old locks needed repair, and at best new ones should be built. Congress, in the same year, began appropriating funds to repair the old locks while work was begun on a new lock. Engineer Major Godfrey Weitzel supervised the



The old State Lock at Sault Ste. Marie. Lock tenders lived in the two houses beside the lock,

design and construction of a new canal and lock; construction began in 1876 and was completed in 1881. By that time, the State of Michigan had transferred the facility to the federal government. After only a short time in operation, it became clear that a larger lock was needed, and the Corps throughout the early 1880s recommended the new works. That project was begun in 1887 and completed in 1896. The pressure, however, remained as traffic on the Lakes had continued to increase, especially after the opening of the Mesabi iron ore mines in the early 1890s.<sup>19</sup>

The Corps involved itself in long-term improvements to other links among the Great Lakes. Dredging begun in the Detroit River in the late 1870s was completed in 1890. The St. Clair Flats were deepened between 1886 and 1892. In 1884, after five years of work, the Corps completed dredging the American channel of the St. Marys River. The Engineers also participated in the first comprehensive planning for the Great Lakes by advising Congress during the drafting of the River and Harbor Act of 1890 which authorized funds to improve the Great Lakes navigational system. Under the provisions of the act, the Corps was to conduct a survey to mark out a 20-foot ship channel in the waters connecting the Lakes Erie, Huron, and Superior. Work on the dredging began in 1893 and was completed by 1897. The new channel vastly improved shipping on the Lakes, easing the movement of Minnesota's iron ore, Wisconsin's lumber, and Pennsylvania's coal.<sup>20</sup>

Trade among Lake ports was eased by these improvements. Those interested in foreign trade from those ports, however, were not so well served.

Farmers exporting wheat, flour, cheese, and meat products were the most affected. Railroad transportation was the major outlet for these shipments, but it was more expensive than water transportation. The Erie Canal was woefully inadequate, even after extensive modifications in the 1880s. It was still too shallow and had too many locks, thereby slowing traffic. The Canadian canals along the St. Lawrence were attractive, but only small ships were capable of making this slow passage. Nationalistic sentiments also lessened the attractiveness of those canals. The Treaty of Washington of 1871 had given the Canadians the right to terminate American access to the canals on two years notice. And, in addition to that potential threat, many Midwest businessmen and politicians believed that American use of the canals promoted Canadian and British interests, especially the Canadian merchant marine which might eventually divert important traffic from New York and the other major American East Coast ports.<sup>21</sup>

Despite these reservations, Midwest farmers and businessmen continued to focus attention on the St. Lawrence. This interest increased in the early 1890s when it became clear that an all-American ship canal from the Lakes to the Hudson across New York would be prohibitively expensive. Congress turned its attention to the St. Lawrence in 1892 in response to a resolution introduced by Minnesota Congressman John Lind. He proposed that the government negotiate an agreement with the Canadians to improve the Welland and St. Lawrence canals while the United States would deepen the Great Lakes channels to the same depths as the Canadian works. Nothing came of Lind's recommendation other than to draw attention to the possibility of cooperation.<sup>22</sup>

Canadian and American businessmen, however, took the initiative and convened a deep waterway conference in Toronto in September 1894. The St. Lawrence came in for the most attention, although other routes to the eastern seaboard were discussed. The convention recognized, however, that joint American-Canadian action would be necessary to make improvements, and the delegates urged their governments to cooperate with each other. To continue that effort they formed the International Deep Waterways Association to carry on an extensive lobbying campaign on both sides of the international boundary. One result of the propaganda effort was the appointment of a joint Deep Waterways Commission in 1895 to study feasible routes for a deep waterway connection between the Lakes and the eastern seaboard. Its 1897 report concluded that two routes recommended themselves: the St. Lawrence canals and a new project using the Mohawk River to connect Lake Erie to the Hudson.<sup>23</sup>

In response to that report the Corps of Engineers became involved in discussions of a deep waterway. The Canadian commissioners had recommended to their government that funds be appropriated to make engineering surveys of necessary improvements if the United States seemed willing to cooperate. Congress was unsure about cooperation, but it did think further studies were necessary. In 1897 Congress authorized the creation of a board of engineers to make surveys and estimate costs of deep waterways between the Great Lakes and the Atlantic ports.



The board, headed by Engineer Lieutenant Colonel Charles W. Raymond, produced an extensive report in 1900 which did not support the idea of joint U.S.-Canadian improvements. It recognized that there were some advantages to the St. Lawrence route, and it included a full analysis of possible improvements in the International Rapids section of the St. Lawrence, but it supported a more southerly route to connect Lake Ontario to the Hudson. Such a route would have a longer navigation season and, of equal importance to the military, it could be more easily defended. The issue of defense had not played much of a role in the thinking of the International Deep Waterways Association, but it was an issue of great concern to the board. After all, Canada still had close political and economic ties to Great Britain. Relations between the United States and Canada and between the United States and Great Britain had been strained over a number of issues ranging from fishing rights to British pressure on Venezuela, to the charging of tolls on Canadian waterways, and to the Alaskan boundary and the Bering Sea seals controversies. While war between the United States and Great Britain did not seem likely, there was always the possibility that some point of strain between the two might lead to conflict.

The report, however, had little impact. It certainly did not diminish Midwest agricultural and business interest in the St. Lawrence route even though the State of New York was considering enlarging the Erie Canal to accommodate 1000-ton barges. Such a move would not entirely satisfy the needs of the Midwest, but it was better than nothing. New York legislators approved the expansion in 1903, and the expensive project was completed in 1918.<sup>24</sup>

Across the border, there was enough nationalistic sentiment to believe that a joint project with the United States was not a good idea in any case. In the first decade of the century, therefore, the Canadian government focused on building another transcontinental railway. Navigation improvements were discussed and some undertaken in the Welland and St. Lawrence canals, but the focus was for the moment on railroads.

In the United States, alternate routes were also considered for getting Great Lakes cargo to the Atlantic. In 1906 the Lakes-to-Gulf Deep Waterway Association championed linking the Great Lakes to the Atlantic via the Illinois and Mississippi rivers. The north-south route attracted important advocates including Presidents Theodore Roosevelt and William Taft, although the Corps of Engineers issued an unfavorable report in 1909 which questioned the costs of constructing and maintaining such an extensive waterway.<sup>25</sup>

Nevertheless 1909 was an important year in the history of the St. Lawrence seaway. Formal Canadian-American cooperation over boundary waters started in that year. The 1909 Boundary Waters Treaty provided for the establishment of a permanent Canadian-American body, the International Joint Commission (IJC), with jurisdiction over boundary-water issues, including those involving temporary or permanent "obstructions or diversions" affecting the natural flow or level of water. The treaty specified that navigation "shall for ever continue free and open for the purposes of commerce" and that the navigation laws of one country were to apply to citizens and vessels of

the other. Vessels of both countries were to have rights to use canals connecting boundary waters, and although the treaty provided that each country could impose tolls on its canals, equal tolls were to be charged to vessels of both countries. In fact, Canada had given up tolls on its waterways in 1905; the United States did the same in 1909.<sup>26</sup>

The establishment of the IJC encouraged advocates of joint action to improve the St. Lawrence canals. Beginning work in 1911, the commission was made up of three representatives from each country. And, from the beginning, those representatives handled the most difficult and intricate issues efficiently and without wrangling. The commission demonstrated that the two countries could work together cooperatively, and its record underscored the possibilities of jointly improving the St. Lawrence.<sup>27</sup>

The years before Canada entered World War I saw increasing interest in the St. Lawrence in both countries. Population, industry, and commerce expanded on both sides of the border, putting more pressure on available means of transportation. Another factor, however, also entered into considerations of the river: electricity. The rapids along the St. Lawrence, for centuries viewed as hindrances, suddenly took on a positive aspect as generators of electricity. The possibilities were enhanced with the increasing success of long distance transmission of electricity. As early as 1881 the Niagara had produced electricity. In 1910 a proposed hydroelectric dam near Barnhart Island raised interest in the entire International Rapids section of the river. Discussions of power development, however, also caused apprehension among advocates of improved navigation. Power works could negatively affect shipping channels, and shippers resisted early 20th-century plans to develop power on the river.<sup>28</sup>

Economic growth and the fear of development of hydroelectric power brought added support for improving navigation on the St. Lawrence. In 1912 the Great Waterways Union of Canada was formed. It became a very vocal lobbying group for all waterways and the St. Lawrence in particular. American politicians from the Great Lakes states showed increasing interest, and, on the eve of the European war, Secretary of State William Jennings Bryan lent his support to a proposed International Joint Commission feasibility study of joint American-Canadian development of the St. Lawrence. These steps were greeted enthusiastically in the Great Lakes region, the mood perhaps best captured in a popular slogan of the time, "Every Lakeport a Seaport." But August 1914 brought war in Europe, and Canadian attention turned to the conflict.<sup>29</sup>

## **World War I, the Corps, and the St. Lawrence**

During the war, the Corps of Engineers again studied the feasibility of improvements in the St. Lawrence. Their 1918 report did not support major improvements in the river, but unlike their earlier opposition in 1900, this report did not focus on defense considerations which questioned developing a strategically important waterway in a foreign country. The 1918 study simply

could not justify such navigation improvements without significant work in the Great Lakes connecting channels and, in any event, it doubted whether there would be increased traffic to warrant the project.

The war experience, however, changed the minds of many other people. By 1920 important lobbying groups in Canada and the United States had begun the long campaign that eventually led to the building of the St. Lawrence Seaway. The war had put enormous strains on rail transportation, and the railroads had proved inadequate. Moreover, the conflict had also demonstrated industry's need for expanded electrical generating capacity. Increasingly, therefore, those who advocated improved navigation worked with those who wanted increased electricity.

The Corps was won over to this position as a result of an extensive three year, joint U.S.-Canadian engineering study completed in 1921. The study concluded that improvements in navigation would not be economically justified without developing the river's capabilities for generating power. Conducted under the auspices of the International Joint Commission, the study was directed by Colonel William P. Wooten, U.S. Army Corps of Engineers, and W.A. Bowden, Chief Engineer, Department of Railways and Canals of Canada. The Wooten-Bowden report, as it came to be known, was the basis for 20 years of discussions about building a seaway.

The United States experienced the economic effects of World War I long before entering the conflict in 1917. Industrial and agricultural production had expanded rapidly to meet European wartime demands, with industrial production alone increasing 40 percent between 1914 and 1916. Entry into the war strained an already taxed railroad system and chaos eventually forced the government to take over the railroads. The railroads' problems underscored the importance of waterways. The Great Lakes and the St. Lawrence came in for added attention because of the shortage of ships. Government officials recognizing the shipbuilding potential of the Great Lakes ports also had to recognize the limitations of the Welland and St. Lawrence canals—only smaller ships able to transit those canals could be constructed for service outside the region.<sup>30</sup>

Wartime demands also pointed up the need for more electric power in both countries. Officials in Washington became more sensitive to the issue of the St. Lawrence as a power source because of a wartime controversy over private use of the river. The Aluminum Company of America, ALCOA, had permission from the International Joint Commission to build a submerged dam in the St. Lawrence between Long Sault Island and the American side of the river. The Secretary of War had supported the proposal because the water was to be diverted to ALCOA's Massena facilities which produced aluminum necessary for the war. The IJC had approved the application, but the proposal had also engendered serious opposition in New York and in Canada.

Out of the Canadian opposition came the first serious proposal that the United States and Canada jointly plan and develop the St. Lawrence's navigation and power potential. In September 1918, the Canadian government, worried about a piecemeal approach to improving the St. Lawrence, proposed a treaty to formalize a comprehensive approach to improving navigation and developing power on the river. The U.S. Department of State, however, did

not follow up the proposal. The war and post-war planning took top priority, and with IJC approval of ALCOA's plan, the immediate need for State Department action faded. There were also constitutional and public policy questions. Officials in Albany believed their state had the right to develop water power on a river that was within New York boundaries, while some members of Congress opposed the public development of power. And, then, there were the Corps of Engineers reports that Congress had authorized in August 1917. These reports had studied the possibilities of improving navigation on the St. Lawrence and concluded that the United States should not do anything until the Canadians improved the Welland and deepened their canals in the St. Lawrence.<sup>31</sup>

Nevertheless, World War I energized Midwest support for improving the St. Lawrence. As discussed earlier, the conflict had shown the limits of the railroads in meeting expanding agricultural and industrial production and, at the same time, demonstrated the limitations placed on the shipbuilding potential of the Great Lakes states. Finally, the opening of the Panama Canal in 1914 had challenged Great Lakes shippers, farmers, and manufacturers. The canal lowered transportation costs to competitors on both the West and East coasts. In response, Canadians and Americans again turned to pressure groups to convince their respective lawmakers of the need to improve the St. Lawrence. In 1919 American businessmen formed the Great Lakes-St. Lawrence Tidewater Association and the Canadians, the Canadian Deep Waterways and Power Association.<sup>32</sup>

One of the American group's first efforts helped increase the Corps' interest and involvement in discussions of what work was needed on the St. Lawrence. Friendly senators introduced legislation directing the International Joint Commission to study the feasibility of a joint comprehensive project to develop the St. Lawrence from Montreal to the head of the Lakes. It was this initiative that had led to the 1921 Wooten-Bowden report which diminished the Corps' opposition to the St. Lawrence improvements.<sup>33</sup>

## **The Corps and Early Planning for a Seaway**

Despite its early lack of interest, the Army Engineers played a central role in planning a St. Lawrence seaway. Up through World War I, their studies had been skeptical of proposals to improve river navigation. They did not think it economically feasible, especially before the Canadians had improved the Welland and St. Lawrence canals. As reflected in the Wooten-Bowden report, however, World War I had changed attitudes in the Corps. For one thing, the meeting of wartime demands had demonstrated the enormous potential for the Midwest's commercial growth. The consistent and insistent support in the Great Lakes region had influenced the Corps too, since Corps personnel in the Lakes region and in Washington knew the leaders in the movement to gain American participation in improving the St. Lawrence. Finally, the Corps' own studies indicated the need for more hydroelectric power in New York and New England.<sup>34</sup>

Corps involvement in the political movement for a St. Lawrence seaway, however, was circumspect. For most of the long years of political struggle, the Engineers focused on the complex technical issues involved in designing a joint power-navigation project. The seaway project created strong opposition among East, West, and Gulf coast port interests and their representatives in Congress. It also faced opposition from the State of New York because its officials supported the New York State Barge Canal (formerly the Erie Canal) as an alternative to the St. Lawrence. The Corps, involved in projects in all of the ports and in New York state, had to keep a discreet distance from too great involvement in the political maneuvering over the proposed seaway.

The Corps' contribution during those years was in the technical field and as a liaison with Canadian engineers. Throughout the 1920s and 1930s, the Corps worked with the Canadians on studies of what in fact would be needed on a comprehensive power and navigation project in the St. Lawrence. These studies proved controversial, since the Americans and the Canadians had different technical approaches to the project. Eventually, however, the two sides compromised. In 1942, the Corps issued an authoritative report reflecting the decades of discussion. Because of its detailed analysis of the many engineering issues raised, this document, as amended in 1946, formed the basis for the ultimate planning and construction of the seaway in the 1950s.

In short, against the complex political maneuvering in both the United States and Canada, the Corps and its Canadian counterparts worked out the details of what was to become the St. Lawrence Seaway. These efforts proved critical when the project was ultimately approved and time and financing became major factors. The project as a whole, both power and navigation works, was to be self-liquidating and the builders were pressed to complete the project quickly so that revenue could be generated to begin paying off the debt. The extensive examination of the major engineering issues well before work was begun made possible a fairly rapid final design and scheduling of the project.

The start of that period of intensive cooperative work had been the Wooten-Bowden report. After Wooten and Bowden had presented their report to the International Joint Commission in June 1921, the commission had held public hearings. Alternatives proposed at those meetings were also included in the final report issued in December 1921. As mentioned earlier, the report concluded that improvements for navigation alone were not justified without taking advantage of the river's potential for the generation of hydroelectric power. Power could be most easily developed in the International Rapids section of the river, and it was in this stretch that the Engineers recommended dual development of power and navigation. Power could be developed in other parts of the river later if demand warranted it. Dredging in the project should be to a 25-foot depth, with 30-foot depths over sills in the locks. If necessary, the channels could later be deepened to 30-foot depths. As for other navigation projects the report recommended canals to allow ships to get from Montreal harbor to the deeper water in what was called Lake St. Francis, a reach of the river upstream from the city.<sup>35</sup> And, it recommended that Canada's Welland

Canal be treated as a part of the project—a provision ultimately dropped in the final planning.

The International Joint Commission supported the report's findings and recommended that a U.S.-Canadian treaty be signed to carry out the necessary work. But, as extensive as the Wooten-Bowden report was, the hearings indicated that there was little agreement on how best to proceed. The commission, therefore, recommended that an expanded engineering board be appointed by both governments to further study the actual construction of a St. Lawrence waterway.

Canada and the United States responded positively to the commission's recommendation. In 1924 each appointed three engineers to work with the IJC. The American representatives were drawn from the Corps and included the Chief of Engineers, then Major General Harry Taylor. This Joint Board of Engineers looked more closely at the many technical issues raised by the Wooten-Bowden report's recommendations. But the more these proposals were examined, the greater the degree of difference that arose between the American and Canadian approaches to the problems. Indeed, the engineering board's 1926 report could not agree on any one approach. Instead, it included two sets of recommendations.<sup>36</sup>

The development of power was the source of greatest difference between the two countries. The United States proposed what the Engineers called a "single-stage plan," whereas the Canadians wanted a "two-stage plan." In essence, these proposals differed in that the Americans wanted power generation centered at the downstream end of Barnhart Island, with two powerhouses there. The Canadians advocated developing power at both Barnhart and Ogden islands. More than location was involved in the disagreement, since the choice of site influenced control over the flow of water, which in turn affected navigation conditions. American members of the board maintained that their suggestions made navigation easier and provided more power at slightly less cost than the Canadian plan. The two-stage plan, the Canadians countered, required less flooding of land and would allow for speedier development of power.<sup>37</sup>

At about the same time the Joint Board of Engineers made its report, the Chief of Engineers, then Major General Edgar Jadwin, issued the Corps' findings on a related matter. At the behest of the St. Lawrence Commission, which had been appointed to advise the Joint Board, the Corps of Engineers had investigated the feasibility of building a deep-water route from the Great Lakes across the state of New York to the Hudson River. The Chief's report unequivocally came out in favor of the St. Lawrence route. Combined with the obvious possibilities of joint power development, the St. Lawrence was clearly preferable in providing navigation for ocean vessels between the Great Lakes and the sea.<sup>38</sup>

Eventually, the United States and Canada compromised on what was called a "controlled single stage" plan. During the 1930s the Canadians singly, and jointly with the Americans, continued to study the proposed waterway and power projects. In 1932, a reconvened Joint Board of Engineers came up with a compromise two-stage proposal. This board's report served as

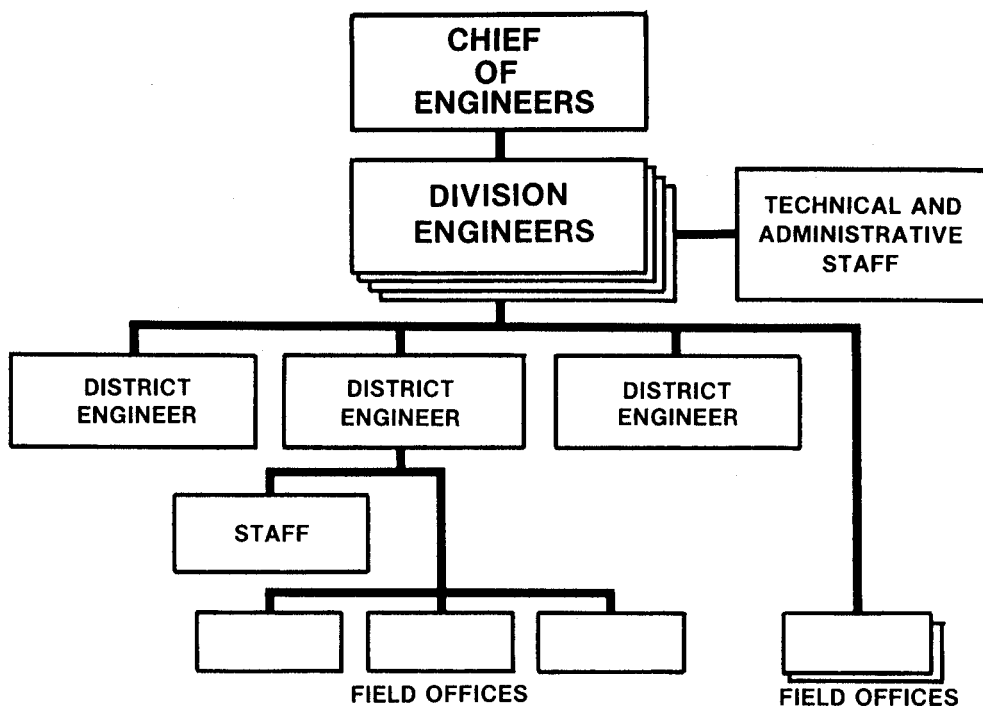
the basis for a treaty between the United States and Canada, which, although signed, failed to pass the United States Senate. The Canadians continued to study the problem, and in 1939 proposed what was called a "238-242" controlled single-stage plan for development. This reflected earlier American ideas, and was taken in the spirit of compromise shown by the United States earlier in the 1930s when it had accepted a modified two-stage plan as the basis of treaty negotiations. In turn, the plan of 1939 prompted the Corps study of 1942 (amended in 1946) upon which the final planning for the seaway was based.<sup>39</sup>

As indicated earlier, these engineering studies had not occurred in a political vacuum. While the Engineers conducting the investigations kept out of politics, the fate of their recommendations was decided on that level. Political events in both Canada and the United States overtook the St. Lawrence project studies on numerous occasions.<sup>40</sup> In Canada, there were federal-provincial disputes over the project. The disputes even reached the municipal level. The City of Montreal was divided—at times its leaders worried that the seaway might harm its transshipment business, at other times they happily contemplated the benefits of growing commerce through their port. In the United States the long-standing questions raised earlier continued to affect government interests in and support for the seaway. Opponents of public power were hostile to the project, as were the railroads and the coastal ports. New York State wanted a ship canal through its territory as well as the development of power in the International Rapids section of the St. Lawrence.<sup>41</sup>

The events of the time, however, did not always work against the seaway. The onset of World War II again pointed out to national leaders the need for increased hydroelectric power capacity. War in Europe also revived interest in Great Lakes shipbuilding, giving further impetus to study of the St. Lawrence waterway. And, in this context of heightened interest and concern, the two governments authorized the studies that in the end formed the basis for the construction of the seaway in the 1950s.

In January 1940 the two federal governments again attempted to come to some agreement on how to develop power in the International Rapids section of the St. Lawrence River. Each appointed representatives to a board of engineers which was to evaluate all the proposals that had been made to achieve that objective. The board was to report to two temporary agencies, one Canadian and the other American, appointed to coordinate the study. Making its report in January 1941, the board recommended the "238-242" Controlled Single-Stage Project. The findings included an outline of the scope of improvements, a list of principal features, and the recommended locations for the various improvements.

After receiving the report, the Canadian and American supervisory agencies turned to the Corps of Engineers to work up the detailed surveys necessary to make the improvements for power and, ultimately, navigation. The incumbent Democratic administration supported that work as the President, Franklin D. Roosevelt, hoped to see power developed in time to help in the war effort.<sup>42</sup>



Organization Chart of the Corps of Engineers' Civil Works Districts and Divisions.

In October 1940, the Corps established the St. Lawrence River District with headquarters at Massena, New York, solely to carry out that survey work. The surveys were underway by late 1940 and proceeded on the basis of the "238-242" Controlled Single-Stage Plan. At the end of April 1942, the District submitted its report after which the District was abolished. Its "St. Lawrence River Project, Final Report 1942" referred to earlier, became the basis for the later planning and construction of the seaway. It presented detailed surveys of the area, extensive plans for the features to be included in the project, and extensive subsurface analyses and land title searches. In 1946, as a result of model studies at the Corps' Waterways Experiment Station in Vicksburg, Mississippi, and further subsurface tests at the proposed sites, the Corps issued an addendum. With this addition, the 1942 final report became the basic scheduling, planning, and design document for the later improvements in both power and navigation.<sup>43</sup>

By the spring of 1942, however, when the Corps completed the report, the United States was at war. Before American entry into the conflict, Roosevelt had seen the project as providing power essential to the war effort as well as the navigational improvements needed to realize Great Lakes ship-building potential. But entry into the war dampened that earlier administration enthusiasm. The seaway project, according to Corps estimates, would take three years to build, limiting its effectiveness. And, of more significance, the seaway would take away materials needed for more urgent war-related projects. Thus, events had intervened once again to delay a St. Lawrence seaway.<sup>44</sup>



## Post World War II Developments

Interest in the seaway project grew during World War II. Power needs in both Canada and the United States became acute, and, with peace, seaway proponents tied postwar economic recovery in the Great Lakes region to the provision of increased supplies of hydroelectric power. The Corps' detailed 1942 report provided the extensive information and research for a realistic plan of action for building the project, and it was a plan that commanded the support of both American and Canadian government engineers. Yet opposition to the project remained. Opponents in the United States were as adamant as ever, and they did what they could to prevent the project from being approved.

The railroads and East Coast port interests led the fight against the seaway, basing much of their public opposition on the idea that the seaway would constitute a subsidy to one mode of transportation not open to others. They also thought that the "subsidy" would help foreign (that is, Canadian) business at the expense of American railroads, ports, and shippers. Seaway proponents maintained that the opposition was based on the fear of competition, a competition which would benefit shippers and consumers by lowering transportation costs.

To counter the subsidy argument, seaway proponents accepted the idea of charging tolls to pay for the project. This political expedient, however, flew in the face of the American tradition of free inland waterways and changed the basis of the project. In April 1947 the Canadian government accepted the proposal "in principle" with the condition that the two governments make suitable arrangements to determine and collect tolls. Legislation to that effect died in the U.S. Senate in February 1948, a victim of the continued efforts of the groups that traditionally opposed the project.<sup>45</sup>

In the meantime, Canadian support for the seaway increased. On the transport issue, railroads, unable to handle the growing grain trade, were strained even further after the discovery of iron ore in Quebec and Labrador. On the power question, both provincial and federal officials saw economic development threatened without increased sources of hydroelectric power. South of the border, the State of New York also supported hydroelectric development, in large part because the late 1930s had brought shortages which were aggravated during the war.

The inability of Congress to pass suitable legislation authorizing a binational comprehensive project to develop power and improve navigation made proponents in Canada and New York explore other arrangements. In 1948 the State of New York and the Province of Ontario worked up their own plans to immediately develop power in the International Rapids section of the St. Lawrence. The administration of President Harry S. Truman opposed, at least initially, dividing the project. In any event, New York's power proposal needed the approval of the Federal Power Commission. Opponents of public power challenged the application and threatened court action if the FPC ruled in favor of the proposal.<sup>46</sup>

Canadian officials despaired at the apparent inability of the United States government to cooperate in a joint project. And, therefore, after two years of discussion, Parliament created the St. Lawrence Seaway Authority (SLA). The agency was instructed to construct, operate, and maintain the waterway which had been discussed for decades. Parliament also authorized the SLA to cooperate with appropriate American agencies, if that was possible. But if the United States would not cooperate, the SLA had the authority to proceed on its own. In 1952, Congress once again rejected proposals for a jointly built comprehensive power and navigation project. The Canadian government then went ahead and proposed an all-Canadian waterway and a joint Ontario-New York power project. In an exchange of notes the Truman administration agreed to support the Canadian proposal.<sup>47</sup>

A delay in considering New York's application at the Federal Power Commission gave the President one more opportunity to push Congress for legislation supporting an American role in the project. In January 1953 the Canadian government agreed to delay one more time, and on 6 May 1954 Congress at last authorized American participation in the project. The new administration under Dwight D. Eisenhower supported the project in large part because of defense considerations—any such strategic waterway leading into the center of the United States should be at least partly under American control. In addition economic considerations had expanded as American steel makers became convinced that they would eventually need iron ore from the Quebec-Labrador fields. And, finally, the willingness to accept tolls had tipped the balance among undecided congressmen, since with the tolls the project would ultimately pay for itself.<sup>48</sup>

Congress created the St. Lawrence Seaway Development Corporation to construct the American part of the project. The public corporation would mirror Canada's St. Lawrence Seaway Authority, providing American input not only during construction but also on the question of tolls which would have to be jointly determined and administered. It would also oversee the repayment of the Seaway bond debt to the U.S. Treasury.

To accomplish their purpose, both the Seaway Development Corporation and the Seaway Authority would need technical and coordination assistance. Providing such assistance to the Development Corporation would pose novel challenges to the Corps of Engineers, the organization ultimately chosen for this responsibility.